ADDENDUM

Greenhouse Gases and Global Climate Change

1.0 Greenhouse Gases and Global Climate Change

Global climate change is a change in the average weather of the earth which can be measured by wind patterns, storms, precipitation, and temperature. Scientific research has indicated that the human-related emissions of greenhouse gases (GHG) above natural levels are likely a significant contributor to global climate change. Greenhouse gases are gases that trap heat in the atmosphere and regulate the Earth's temperature and include water vapor, carbon dioxide (CO_2), methane, nitrogen oxides (NOx), chlorofluorocarbons (CFCs), and ozone (O_3).

The primary activities sectors associated with greenhouse gas emissions include transportation, utilities, industry/manufacturing, agriculture, and residential (California Energy Commission (CEC) 2006). End-use sector sources of greenhouse gas emissions in California are as follows: transportation (40.7 percent), electricity generation (22.2 percent), industry (20.5 percent), agriculture and forestry (8.3 percent), and other (8.3 percent) (CEC 2006). The main sources of increased concentrations of greenhouse gases due to human activity include the combustion of fossil fuels and deforestation (CO_2); livestock and paddy rice farming, land use and wetland depletions, and landfill emissions (methane); refrigeration systems and fire suppression systems use and manufacturing (CFCs); and agricultural activities, including the use of fertilizers (NOx).

Climate change could potentially affect other resource areas, including hydrological resources, biological resources and socioeconomics. Projected impacts to the local region caused by climate change include: decreases in the water quality of surface water bodies, groundwater, and coastal waters; sea level rises; increased flooding and fire events; decline in aquatic ecosystem health; lowered profitability for water-intensive crops; changes in species and habitat distribution; and impacts to fisheries (California Regional Assessment Group 2002).

2.0 California Assembly Bills

California has taken a significant role in reducing greenhouse gas emissions into the atmosphere. California Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, requires that the state's global warming emissions reach 1990 levels by 2020, and be reduced to 80% of 1990 emissions by 2050. The emissions reduction is expected to be achieved through the continuation of existing state policies, and through the enforcement of a statewide greenhouse gas emissions limit (to be incorporated starting in 2012). Existing policies aimed at limiting greenhouse gas emissions include

AB 1493 (the Pavley Bill), which defines standards for cars and light trucks and is projected to result in an 18 percent reduction in emissions. Carbon dioxide is the principal greenhouse gas responsible for trapping heat in the atmosphere leading to global warming. Worldwide California is the 12th greatest emitter of CO_2 and AB 32 was enabled to take a global lead to reduce emissions and the dangers of global warming.

The California Global Warming Solutions Act was passed subsequent to completion and public review of the Draft Environmental Impact Report (DEIR) for this project. However, this addendum has been provided to disclose potential GHG emissions associated with the proposed Ellwood Marine Terminal (EMT) lease renewal.

3.0 Proposed Project Global Climate Change Analysis

Emissions from the proposed Project into the environment would include greenhouse gasses known to cause global climate change. The primary gas emitted from the existing operations is CO_2 and amounts to approximately 279 tons per year (127 kg/yr). Under a worst-case, the existing EMT could operate at maximum capacity with all barge transport going to the furthest distance (San Francisco Bay terminal). Under this scenario, the Project could directly contribute 2,571 tons (1,166 kg) of CO_2 into the atmosphere each year. This represents an increase of more than 2,292 tons per year (1,140 kg/yr) from current operational emissions from the EMT and barge Jovalan. Under a best case maximum capacity scenario, which would require all barge trips be made to a terminal in San Pedro Bay (Ports of Los Angeles and Long Beach), the Project would contribute approximately 1,075 tons (488 kg) of CO_2 emission each year, a 796 ton (361 kg) increase from current operations. Whether the EMT operates under existing conditions or at maximum capacity, GHG emissions are a very small fraction (no more than 0.0005 percent) of the 492 million metric tons of CO_2-equivalent GHG emissions produced in California in the year 2004 (CEC 2006). Mitigation Measures AQ-1a and AQ-1b provided in Section 4.3 Air Quality would provide some reductions to any potential future GHG emission increases, assuming that there is any future increase in local crude oil production and barging. Renewal of the EMT lease in and of itself would not result in any direct increase in greenhouse gas emissions, but the lease renewal, in combination with other projects, such as a resumption of productions at PRC-421 or enhanced oil recovery in the South Ellwood Field, could result in future increases in GHG emissions from the EMT and barge transportation and incrementally exacerbate global warming effects.

4.0 No Project Alternative Global Climate Change Analysis

Under the No Project Alternative, two transportation options (trucking and pipeline) were examined in the event the EMT is not renewed and other means of transportation would be necessary to continue production from the Ellwood Field. Carbon dioxide emissions from the truck transportation option would result in an approximate 3,724 ton per year (1,689 kg/yr) increase per year over current operations. Therefore, truck transportation would represent a substantial increase in GHG emissions over the proposed Project.

The pipeline option would emit approximately 469 tons (213 kg) of CO_2 during its construction; however, after construction the pipeline transportation option would be expected to emit negligible amounts of greenhouse gases. Given the substantial reduction in GHG emissions associated with the pipeline versus barge crude oil transportation or trucking, pipeline transportation would represent a substantial benefit over the proposed Project.

5.0 References

California Energy Commission (CEC). 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, Staff Final Report. CEC-600-2006-013-SF.

California Regional Assessment Group. 2002. Preparing for a Changing Climate: the Potential Consequences of Climate Variability and Change. A Report of the California Regional Assessment Group for the U.S. Global Change Research Program. September 2002.

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